

## 2009 JPL SURP Strategic Topic Areas

<b>Topic Area:</b>	10. Develop and Nurture the Next Generation of "Rocket Scientists"
<b>Champion(s):</b>	Adrian Ponce – (818) 354-8196 [Adrian.Ponce@jpl.nasa.gov] for S&T Research To be announced for engineering

JPL has always needed new technical talent just to balance the attrition rate. The need for new technical talent is larger now as the “baby boomer” generation is nearing retirement. The retirement of the “baby boomer” generation is common across the nation which causes a nation-wide competition for new technical talent at the same time that enrollment in science and engineering at US universities is generally flat or decreasing. Concurrent with the competition for science and engineering talent is the constant or accelerating pace of technical change. These factors of competition for talent and the pace of technical change add stress and urgency to JPL’s efforts to hire new technical talent. Additionally, it has been and continues to be clear, that students who have had some type of “hands on” experience in school are often quicker to integrate into JPL project work and quicker to add value to JPL. “Hands on” experience dealing with the conception, design, building and operation of an entire system for a space science application is the ideal.

### **Vision**

In 5, 10 and 10 years, 20, 50 and 100% of new grad hires at JPL will have participated in building and operating a spacecraft in Earth orbit.

### **Solicitation**

JPL invites proposals for efforts that will enhance your students’ preparation for a professional career in space systems/science at JPL or elsewhere. Two types of proposals are solicited: 1) support for Graduate Student research in a space science research topic of high interest to JPL and/or 2) support for systems development classes.

### **Support for Graduate Student Research**

JPL invites proposals for support for a graduate student performing research of interest to a JPL scientist. The topic of the research can be related to one of the JPL strategic challenges or not but must be of keen interest to a JPL mentoring scientist. The research activities could include instrument development and/or algorithm development for successful mission data retrieval and analysis. Attractive proposals will have 3 key elements: 1) one of the best and brightest graduate students, 2) a research topic of interest to JPL and 3) a JPL mentor scientist.

### **Support for Systems Development Classes**

JPL invites proposals for efforts that will provide students a research focused educational experience in the development of a product intended for a space science application. The educational experience should include the conception, design, building and operation of an entire system. This educational experience could be part of an established or new class. Equally important with the outcome of the student research funded by JPL is the learning that takes place during the development of the product. A few examples of research projects which would match the intent of this request are Cubesats, <http://cubesat.calpoly.edu/> ; capstone classes, or engineering design classes where the student team[s] focus on a topic of keen interest to JPL.

Research applications may be intended for the following environments vacuum: solid surfaces [hi and low G]; atmospheres [hi and low density] and liquids. It is understood that the actual operation of a space system includes launch into space which is an activity beyond the scope of this request. Given the difficulty in actually experiencing the space environments, operation in Earth analogs is acceptable.

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Examples of preferred proposal characteristics are:

1. span a full academic year
2. include a mix of graduate and under graduate students
3. include a mix of engineering and science students
4. students work in teams where roles are described, i.e. leader, system engineer, principal investigator, individual contributor or by project subsystem
5. address the product content of the other JPL Strategic Challenges